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भारतीय मानक

पेट्रोलियम उद्योग – शब्दावली

भाग 2 गुणधर्म और परीक्षण

(पहला पुनरीक्षण)

Indian Standard

PETROLEUM INDUSTRY — TERMINOLOGY

PART 2 PROPERTIES AND TESTS

(First Revision)

ICS 10.040.75; 75.080

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BUREAU OF INDIAN STANDARDS
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Price Group 6

Petroleum Products Sectional Committee, PCD 3

FOREWORD

This Indian Standard (Part 2) (First Revision) which is identical with ISO 1998-2 : 1998 'Petroleum industry — Terminology — Part 2 : Properties and tests' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of Petroleum Products Sectional Committee and approval of the Petroleum, Coal and Related Products Division Council.

This Indian Standard was published in 1968 with a view to eliminate the ambiguity arising from different interpretations of terms used in petroleum trade and industry and to establish a generally recognized terms. Since the industry has progressed manifolds over the years, a need was felt to bring in newer terms. The committee, therefore decided to revise this Indian standard to completely align with ISO 1998-2 :1998 under the dual numbering system. Accordingly, the title has been changed as 'Petroleum industry — Terminology : Part 2 Properties and tests'.

It is envisaged to issue this standard in eight different parts, each dealing with a specific aspect. The other parts in this series are as under:

Part 1	Raw materials and products
Part 3	Exploration and production
Part 4	Refining
Part 5	Transport, storage, distribution
Part 6	Measurement
Part 7	Miscellaneous terms
Part 8	General and index

The English version of the text of ISO standard has been retained without deviations for publication as Indian Standard. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

For tropical countries like India, the standard temperature and the relative humidity shall be taken as 27 ± 2°C and 65 ± 5 percent respectively.

Indian Standard

PETROLEUM INDUSTRY — TERMINOLOGY

PART 2 PROPERTIES AND TESTS

(First Revision)

1 Scope

This part of ISO 1998 consists of a list of terms, in use in the petroleum industry to indicate properties of petroleum products and test methods, together with the corresponding definitions in the two languages.

ISO 1998 is intended to cover the purposes of the part of the petroleum industry dealing with crude oils and petroleum products, that means all related operations arising from the production field to the final user. It is not intended to cover either petroleum equipment, or any operation in the field. However, some pieces of equipment or some operations of exploration and production are defined. The corresponding terms were introduced only when they appear in a definition of a product or process and when their definition was found necessary for understanding or for avoiding any ambiguity. Where a terminology of petroleum equipment is needed, it corresponds to the scope of ISO/TC 67, *Materials, equipment and offshore structure for petroleum and natural gas industries*.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1998-99:—[1] *Petroleum industry—Terminology—Part 99: General and index.*

3 Term numbering

The general classification and numbering system used in ISO 1998 employs digits grouped in three categories:

x.yy.zzz

where

x is the part number of ISO 1998, in this case Part 2;

yy is the subcategory in which the term appears. Part 2 has eight subcategories;

- 10 physical and chemical properties of petroleum products
- 20 properties of bitumen and bituminous binders
- 30 properties of fuels and distillates
- 40 properties and tests of gases and light products
- 50 properties of lubricants
- 80 properties of solid and semi-solid products
- 90 miscellaneous
- 99 acronyms

zzz is the serial number of the individual term.

4 Index

See ISO 1998-99.

5 Order of listing

Terms are listed in serial number order.

2.10 Physical and chemical properties of petroleum products

2.10.001

density

mass of the liquid divided by its volume

NOTE 1 When reporting the density, the unit of density used, together with the temperature, shall be explicity stated, for example, kilogram per cubic metre or gram per millilitre at t °C.

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[1] To be published.

The standard reference temperature for international trade in petroleum and its products is 15 °C (ISO 5024 [4]); but other reference temperatures may be required for legal metrology or other special purposes.

NOTE 2 The preferred unit is the kilogram per cubic metre, but provision is also made for use of the gram per millilitre.

2.10.002
relative density

ratio of the density of the considered product to the density of a standard product, these two densities being given in specified conditions

NOTE 1 This term now replaces the former "specific gravity".

NOTE 2 Applies only to the French language.

NOTE 3 It is a dimensionless number.

2.10.003
relative density of liquids

ratio of the mass of a volume of the liquid at a temperature t_1, to the mass of an equal volume of pure water at a temperature t_2, i.e. the ratio of the density of the liquid at a temperature t_1, to the density of pure water at a temperature t_2

NOTE When reporting the relative density, the temperature t_1 and t_2, should be explicitly stated. The standard reference temperature is 15°C but 20°C is also in general use for t_1 and t_2, and other temperatures may be employed for t_1.

2.10.004
relative density of gases

ratio of the mass of a given volume of gas at temperature t and pressure p to the mass of an equal volume of dry air at t and p; or alternatively the ratio of the density of the gas at t and p to the density of dry air at t and p

NOTE The values of t and p are specified typically as 0°C and 101,325 kPa (15°C is specified for t, in some countries).

2.10.005
gravity API

arbitrary scale adopted by the American Petroleum Institute for characterizing the relative density of oils

NOTE 1 Its relation to relative density is as follows:

$$\text{gravity API} = \frac{141{,}5}{\text{relative density } 60°\text{F} / 60°\text{F}} - 131{,}5$$

NOTE 2 60°F corresponds to approximately 15.6°C

NOTE 3 The measuring scale is calibrated in terms of degrees API.

2.10.010
water and sediment

whole of the solids and aqueous solutions present in a petroleum product, that either settle out on standing or may be separated by accelerated standardized methods

2.10.020
vapour pressure

pressure exerted by the vapours emitted by a petroleum product in a specified apparatus under standardized conditions

2.10.021
Reid vapour pressure

absolute pressure exerted by a liquid under the specific conditions of test temperature, vapour/liquid ratio and air saturation defined by the Reid apparatus and specified test procedure

NOTE The "Reid vapour pressure" only applies at 37.8°C (100°F), and at a vapour/liquid ratio of 4/1, and has no exact relationship to true vapour pressure due to the degree of water saturation of the vapour under the conditions of this test. Water-miscible components of the liquid under test depress the result.

2.10.022
air-saturated vapour pressure

pressure exerted *in vacuo* by air-containing liquids in the absence of dissolved water, at the specified test temperature

NOTE The standard test conditions are a vapour/liquid ratio 4/1, and at test temperatures between 37.8 °C and 100 °C. For liquids containing no significant proportions of water-miscible components, a correlation between Reid vapour pressure and air-saturated vapour pressure can be derived.

2.10.030
viscosity

the internal resistance of a fluid to flow

2.10.031
dynamic viscosity

ratio between the applied shear stress and the velocity gradient

NOTE It is a measure of the resistance to flow of the liquid.

2.10.032
kinematic viscosity

ratio between the dynamic viscosity and the density of the liquid at the temperature of viscosity measured

NOTE It is a measure of the resistance to flow of a liquid under gravity.

2.10.033
apparent viscosity

term used to characterize the resistance to flow of a non-Newtonian product

2.10.034
Newtonian fluid
fluid having a viscosity that is independent of the rate of shear

2.10.040
distillation curve
graphical representation of the percentage by mass or volume of a petroleum product distilled as a function of the temperature reading noted

2.10.041
initial boiling point
temperature reading noted (corrected if required) at the moment when the first drop of condensate falls from the tip of the condenser during a distillation carried out under standardized conditions

NOTE The thermometer reading may be corrected for barometric pressure.

2.10.042
end point
final boiling point
maximum temperature reading noted (corrected if required) during the final phase of a distillation carried out under standardized conditions

NOTE 1 This usually occurs after the evaporation of all liquid from the bottom of the flask.

NOTE 2 The thermometer reading may be corrected for barometric pressure.

2.10.043
dry point
temperature reading note (corrected if required) at the moment of vaporization of the last drop of liquid at the bottom of a flask during a distillation carried out under standardized conditions

NOTE 1 Any drops or film of liquid on the side of the flask or thermometer are disregarded

NOTE 2 The thermometer reading may be corrected for barometric pressure.

2.10.044
decomposition point
temperature reading noted which coincides with the first indications of thermal decomposition of the liquid in the flask, during a distillation carried out under standardized conditions

NOTE The characteristic indications of thermal decomposition are an evolution of fumes and erratic thermometer readings, which usually show a decided decrease after any attempt has been made to adjust the heat.

2.10.045
percent recovered
volume of condensate observed in the receiving graduated cylinder, expressed as a percentage of the charge volume, in connection with a simultaneous temperature reading, during a distillation carried out under standardized conditions

2.10.046
percent evaporated
during a distillation carried out under standardized conditions, the sum of the percentage recovered and the percentage loss

2.10.047
percent recovery
during a distillation carried out under standardized conditions, the maximum percent recovered

2.10.048
total percent recovered
during a distillation carried out under standardized conditions, the combined percentage recovered and percentage residue in the flask

2.10.049
percent loss
during a distillation carried out under standardized conditions, difference between 100 and the total percent recovered

2.10.050
distillation range
boiling range
temperature range which characterized a fraction by its initial and final boiling points

NOTE There exists another definition of this term in the field of aromatic hydrocarbons (see ISO 1543[1]).

2.10.070
flash point
minimum temperature to which a product must be heated for the vapours emitted to ignite momentarily in the presence of a flame, when operating under standardized conditions

2.10.071
fire point
lowest temperature at which a petroleum product ignites and continues to burn for a specified time after a small flame has been applied to its surface under standardized conditions

2.10.072
autogenous ignition temperature
spontaneous ignition temperature
temperature of spontaneous ignition of a petroleum product in the absence of a flame, determined under standardized conditions

2.10.080
pour point
lowest temperature at which an oil will continue to flow when it is cooled under standardized conditions

2.10.081
cloud point
temperature at which a clear liquid petroleum product becomes hazy or cloudy due to the appearance of wax crystals when the test is conducted under standardized conditions

2.10.082
pour point reversion
change in pour point, normally a rise, caused by variation in the heating and cooling rates of a product leading to changes in the wax crystal structure produced

2.10.090
appearance
visual assessment of a product, either directly, or through the eyepiece of specified apparatus

2.10.091
visual appearance
assessment of a product in terms of its colour and clarity, without artificial aids

NOTE 1 It includes the presence or absence of undissolved water or wax in terms of their haze potential and the presence or absence of adventitious particulate matter.

NOTE 2 Haze rating scales are sometimes used as an addition to visual appearance.

2.10.092
bloom
fluorescence of a petroleum product when viewed by reflected daylight

2.10.093
colour scale for undyed products
arbitrary scale for the numerical rating of the colour of petroleum products

NOTE The most common scales used for petroleum products, in order of sensitivity, are

a) platinum-cobalt (Hazen): scale from 0 (lightest) to 500 (darkest), applied to solvents and light distillate fractions;

b) Saybolt: scale from +30 (lightest) to -16 (darkest), applied generally to domestic and aviation kerosines;

c) ASTM: scale from 0.5 (lightest) to 8 (darkest), applied to automative, domestic, commercial, industrial and marine middle distillates.

2.10.094

colour scale for dyed products
scale for the rating of dyed petroleum products, which may comprise both colour standards and numerical values

NOTE 1 More than one colour value may be used to rate a single product.

NOTE 2 Dyed products are frequently specified by means of identified dyes and concentrations.

NOTE 3 The numerical assessment of dyed colour is expressed in Lovibond colour units, against red, yellow and blue standards. A qualitative assessment of colour, on a go/no-go basis, is made against colour standards of maximum and minimum intensity of a specified colored product.

2.10.100
interfacial tension oil/water
force necessary to detach a planer ring of platinum wire from the surface of the liquid of higher surface tension, that is, upward from the water-oil interface, and expressed in millinewtons per metre (mN/m)

2.10.110
emulsibility of a petroleum product
ability of a petroleum product to form an emulsion with water

2.10.111
water miscibility
property of a product to form with water either a solution or a stable dispersion

2.10.112
demulsibility
tendency of an emulsion formed by stirring a product with water to separate on standing

2.10.113
water separation
water shedding
test to measure the ability of a product to separate from water at rest after agitation in the presence of water under standardized conditions

2.10.114
biodegrability
ability of a product to be biodegraded

cf. **biodegradation** (2.10.115)

2.10.115
biodegradation
breakdown of a product involving biological/ biochemical reactions

2.10.116
foaming characteristic
property of a product to form stable or temporary foam under standardized aeration conditions

2.10.120
ash content
percent by mass of carbon-free residue on combustion and pyrolysis

2.10.121
oxide ash
residue obtained after atmospheric combustion followed by heating in a furnace

NOTE Applies to products without metal-containing additives and normally referred to as "ash content".

2.10.122
sulphated ash
residue obtained after atmospheric combustion, followed by fixation of the carbonaceous residue with sulfuric acid before final heating in a furnace

NOTE Applies to products, particularly lubricants or additives, that yield potentially volatile metal oxides as a product of combustion.

2.10.130
dew-point
temperature at which a vapour, contained in a closed vessel under the given pressure, will form a first drop of liquid on the subtraction of heat

NOTE The dew-point of a normal gasoline is approximately the same as the temperature at which 70% by volume distils over in the ISO 3405[2] distillation test. The dew-point of a pure compound is the same as its boiling point.

2.10.040
doctor test
method for detecting certain compounds of sulfur, such as hydrogen sulfide or mercaptans, in colourless or slightly coloured petroleum products, by the action of these compounds on sodium plumbite in the presence of flowers of sulfur

2.10.141
copper strip test
method intended to evaluate the corrosive tendencies of a product with respect to copper

2.10.142
corrosion test
determination, under standardized conditions, of the corrosive action of petroleum products on a metal or metals

2.10.150
aniline point
lowest temperature at which equal volumes of aniline and of the product under test are completely miscible, under standardized conditions

2.10.151
mixed aniline point
lowest temperature at which two volumes of aniline, one volume of the product under test and one volume of heptane are completely miscible under standardized conditions

2.10.152
bubble point
during the standardized determination of the aniline point, the temperature noted at the moment when the bubbles first appear in the body of the mixture

2.10.160
floc point
result of a test conducted under standardized conditions and intended to assess the low temperature compatibility of certain petroleum products with refrigerant fluids

2.10.170
kauri-butanol value
standardized measure of solvent power of hydrocarbons; the higher the kauri-butanol value, the greater the general solvent power

2.10.200
neutralisation
process by which an acid or base condition is brought to a pH (in aqueous system) of approximately 7.0

2.10.201
base number
quantity of acid, expressed in terms of the equivalent number of milligrams of KOH per gram, that is required to titrate the base constituents present in 1 g of sample when titrated under specified conditions

2.10.202
acid number
quantity of base, expressed in milligrams of KOH per gram, that is required to titrate all acidic constituents present in 1 g of sample when titrated under specified conditions

2.10.203
saponification number
number of milligrams of potassium hydroxide consumed by 1 g of a sample under the specified test conditions

2.10.210
bromine number
mass, in grams, of bromine which will combine with 100 g of the petroleum product under standardized conditions, and used as a indication of the degree of insaturation

2.10.211
iodine value
iodine number
mass, in grams, of iodine combining under standardized conditions with 100 g of sample, thus indicating its degree of insaturation

2.10.300
ageing test
test which induces in a product the accelerated development of characteristics similar to those that would develop in service or in storage

2.10.330
thermal stability
ability of a petroleum product to resist chemical degradation at high temperatures

2.20 Properties of bitumen and bituminous binders

2.20.001
Fraass breaking point
temperature at which a film of bituminous binder of defined thickness will break under standardized loading conditions

NOTE Examples of loading conditions are given in EN 12593[5].

2.20.004
thermal susceptibility
characteristic of a bituminous binder which defines the change in rheological characteristic as a function of temperature

NOTE Most commonly applied to penetration or viscosity, but also can be applied to other characteristics, such as ductility, elasticity, etc.

2.20.010
ductility
property of a bituminous binder measured by the maximum elongation by stretching of a standard test-piece before it breaks

2.20.020
penetration index
calculated index which defines the rate of change of the penetration of bitumen with increasing temperature

NOTE The index is calculated either from its penetration at 25 °C and ring and ball softening point, or from penetration values determined at different temperatures.

2.20.030
simulated hardening test
test of assessing the combined effects of heat and air on a thin film of bituminous binder

2.20.035
pseudo-viscosity
ability of cut-backs, fluxed bitumens and bitumen emulsions to flow under standardized test conditions

2.20.040
adhesivity
property of bituminous binders defining their affinity for a reference aggregate, in determined conditions, with or without the presence of water

2.20.045
cohesivity
property of bituminous binders defining their internal breaking resistance

2.20.050
stiffness modulus
ratio of a component of stress to a component of strain

2.20.055
complex modulus
complex number relating the amplitude and phase difference of stress and strain, in tension-compression or shear test on a bituminous binder

2.30 Properties of fuels and distillates

2.30.001
smoke point
maximum height (in millimetres) of flame that can be obtained without smoking when a petroleum distillate is burned in a standardized lamp under standardized conditions

2.30.002
burning test
method for evaluating the burning properties of a domestic kerosine by testing in a standardized lamp

2.30.010

gum
polymeric or oxygen-containing component of gasolines or middle distillates that is soluble in the product under normal storage and handling conditions, but is deposited on evaporation

NOTE 1 Specified evaporation procedures may modify the structure of these compounds, or form new compounds from hydrocarbons existing in the product under test.

NOTE 2 Since many of the reactions leading to gum formation are oxidation-type, the use of additives to slow or prevent the onset of oxidation is common.

2.30.011
existent gum
evoporation residue of aviation fuels, without any further treatment

NOTE Specified procedures normally call for the evaporation of aviation turbine fuels to be carried out by superheated steam, and of aviation gasolines by heated air.

2.30.012
unwashed gum
evaporation residue of non-aviation fuels, without any further treatment

2.30.013
solvent washed gum
residue remaining after the evaporation residue of non-aviation fuels has been washed with heptane and the washings discarded

2.30.014
potential gum
sum of the soluble gum and insoluble gum defined by the specified test method, after accelerated ageing under strong oxidizing conditions

NOTE These conditions may also create a precipitate, separated by filtration, which, when added to the potential gum, defines the total potential residue.

2.30.020
accelerated oxidation
test which attempts to simulate adverse chemical changes that may occur under certain storage and/or usage conditions

2.30.021
induction period
time elapsed between the onset of accelerated oxidizing conditions and a specified breakpoint, normally exemplified by a definitive rate of oxygen absorption

NOTE The test method is generally applied to automotive gasolines, but may also be applied to other gasolines containing a restricted proportion of light unsaturated compounds.

2.30.022
thermal oxidation stability of gas turbine fuels
method for rating the tendencies of gas turbine fuels to deposit decomposition products within the fuel system

NOTE The decomposition products are assessed either by the pressure drop across a fine filter, or by their reaction with a specified heated aluminium tube, which leads to a rateable appearance change in the tube surface.

2.30.030
freezing point
temperature at which solid hydrocarbon crystals, formed on cooling, disappear when the temperature of the fuel is allowed to rise

2.30.100
octane number
number on a conventional scale expressing the knock-resistance of a fuel for spark-ignition engines

NOTE It is determined in test engines by comparison with reference fuels. There are several methods of test; consequently the octane number quoted should be accompanied by reference to the method used.

cf. **motor octane number** (2.30.101), **research octane number** (2.30.102) and **road octane number** (2.30.104).

2.30.101
motor octane number
octane number of a motor gasoline determined in a special laboratory test engine under high "engine-severity" conditions, giving a rough

measure of the high-speed knock properties of the gasoline

2.30.102
research octane number
octane number of a motor gasoline determined in a special laboratory test engine, under mild "engine severity" conditions, giving a rough measure of the low speed know properties of the gasoline.

2.30.103
performance number
number expressing the anti-know quality of aviation gasolines having an octane number above 100

2.30.104
road octane number
octane number of a motor gasoline determined during actual road testing

NOTE Apart from the intrinsic quality of the gasoline tested, the road octane number depends also on the make of the engine of the vehicle but in general lies between the RON and MON of the gasoline.

2.30.105
sensitivity of a motor gasoline
difference between the octane numbers determined by the standard "research" and "motor" methods (RON and MON)

2.30.110
cetane number
number on a conventional scale, indicating the ignition quality of a diesel fuel under standardized conditions

NOTE It is expressed as the percentage by volume of haxadecane (cetane) in a reference mixture having the same ignition delay as the fuel for analysis. The higher the cetane number, the shorter the ignition delay.

2.30.111
cetane index
number, calculated to represent the approximate cetane number of a product from its density and distillation characteristics

NOTE The formula used for calculation is reproduced from statistical analysis of a very large representative sample of world-wide diesel fuels, on which cetane number and distillation data are known, and thus is subject to change at 5 to 10 year intervals. The current formula is given in ISO 4264[3]. It is not applicable to fuels containing an ignition-improving additive.

2.30.150
cold filter plugging point
highest temperature at which a given volume of fuel fails to pass through a standardized filtration device in a specified time, when cooled under standardized conditions

2.40 Properties and tests of gases and light products

2.40.010
analytical evaporation residue
residue remaining after evaporation of the product under specified conditions

2.40.011
analytical atomospheric residue
residue remaining after atmospheric evaporation of the product, and standardizing the temperature to 37.8 °C

NOTE The test is often applied under field conditions to check for gross contamination of LPG by heavier hydrocarbon products.

2.40.012
analytical oily residue
residue remaining after co-evaporation of the product with a solvent, and specified heating to 105 °C

NOTE The test is applied to detect the potential residue that may be deposited in vaporizers or engine fuel systems.

2.50 Properties of lubricants

2.50.001
carbon residue
residue remaining after controlled thermal decomposition of a product under a restricted supply of oxygen (air)

NOTE The historical methods of Conradson and Ramsbottom have largely been replaced by the carbon residue (micro) method.

2.50.003
carbonisable substance in waxes and white oils
impurities sometimes present in trace quantities in waxes and white oils, susceptible to attack by concentrated sulfuric acid with the formation of a yellow brown coloration of variable intensity

2.50.020
viscosity index
number on a conventional scale used to

characterize the variation of the viscosity of an oil with temperature

NOTE A high viscosity index indicates a relatively small change of viscosity with temperature and vice versa.

2.50.030
demulsibility test
test intended to measure the ability of an emulsion of oil and water to separate into two phases, carried out under standardized conditions

cf **demulsibility** (2.10.112)

2.50.031
de-aeration time of turbine oils and hydraulic oils
characterization of the ability of a product to release, under the standardized test conditions, bubbles of air previously dispersed in its bulk

2.50.040
lubricity
ability of a product to reduce wear and friction, other than by its purely viscous properties

2.80 Properties of solid and semi-solid products

2.80.001
Penetration
depth that a standard object, cone or needle penetrates into a test portion under standardized conditions of time, temperature, load, etc

NOTE It is expressed in tenths of a millimetre.

2.80.010
drop point
dropping point
temperature at which a solid or semi-solid petroleum product acquires a certain fluidity in the course of a test conducted under standardized conditions

2.80.011
melting point by cooling curve
temperature at which a melted petroleum wax first shows a specified plateau in its cooling curve when allowed to cool under standardized conditions

2.80.012
drop melting point
temperature at which a petroleum wax or petrolatum becomes, under standard conditions, sufficiently fluid to drop from the bulb of a thermometer previously coated with it

2.80.013
congealing point
temperature, determined by a standard test at which a molten petroleum wax ceases to flow

2.80.015
ring and ball softening point
temperature at which the mass of a specified ball causes a prescribed deformation of a disk of material, retained in a ring, heated at a specified rate

2.80.030
hot tack
property of certain wax melts, particularly desirable in the case of heat sealing of a package, and avoiding the unsealing which might be caused by the tension exerted by the packaged product while the wax melt is still fluid

2.80.031
sealing strength of paraffin or microcrystalline wax
characteristic defined as the force necessary to separate, under standardized conditions, two strips of paper stuck together with paraffin wax or microcrystalline wax

2.80.032
blocking temperature
blocking point
lowest temperature at which two waxed surfaces in contact stick together under standardized conditions

2.80.040
bleeding of a lubricating grease
oil exudation from a lubricating grease

2.90 Miscellaneous

2.90.001
compatibility
ability to resist in physical properties or performance when two or more materials are in contact

2.90.002
compatibility of similar products
resistance to physical changes that occur when

two similar products are mixed, which lead to a change in performance

NOTE Generally related to interaction of additives of different types with similar performance targets.

2.90.003
compatibility of different products
resistance to physical and/or chemical changes that occur when two dissimilar products are mixed, that lead to a noticeable deviation from intermediate properties

NOTE Generally related to the precipitation of a constituent of one of the products.

2.90.004
compatibility with other materials
resistance to change in properties of another material in contact with a petroleum product

NOTE Examples are elastomer swelling/contraction or attack on materials by petroleum products.

2.90.010
precision
closeness of agreement between the results obtained by applying the experimental procedure several times on identical materials and under specified conditions

NOTE The smaller the random part of the experimental error, the more precise is the procedure.

2.90.011
repeatability
(1) qualitatively

closeness of agreement between independent results obtained in the normal and correct operation of the same method on identical test material in a short interval of time and under the same test conditions (same operator, same apparatus, same laboratory)

NOTE The representative parameters of the dispersion of the population which may be associated with the results are qualified by the term "repeatability", for example repeatability standard deviation, repeatability variance. The term "repeatability" shall not be confused with the term "between repeats" or "repeats" when used in this way [cf. **replication** (2.90.020)]. Repeatability refers to the state of minimum random variability of results. The period of time during which repeated results are to be obtained shall therefore be short enough to exclude time-dependent errors, for example, environmental and calibration errors.

(2) quantitatively

value equal to or below which the absolute difference between two single test results obtained in the above conditions may be expected to lie within a probability of 95%

2.90.012
reproducibility
(1) qualitatively

closeness of agreement between individual results obtained in the normal and correct operation of the same method on normally identical test material but under different test conditions (different operators, different apparatus and different laboratories)

NOTE The representative parameters of the dispersion of the population which may be associated with the results are qualified by the term "reproducibility", for example reproducibility standard deviation, reproducibility variance.

(2) quantitatively

value equal to, or below which, the absolute difference between two single test results on identical material obtained by operators in different laboratories, using the standardized test method, may be expected to lie with a probability of 95%

2.90.020
replication
execution of a test method more than once so as to improve precision and to obtain a better estimation of testing error

NOTE Replication shall be distinguished from repetition in that the former implies that repeated experiments are carried out at one place and, as far as possible, one period of time. The representative parameters of the dispersion of the population which may be associated with repeated experiments are qualified by the term "between repeats", or in shortened form "repeats", for example "repeats standard deviation".

2.90.030
accuracy
closeness of agreement between the results of a measurement and the true value of the measurement

NOTE 1 The quantitative expression of accuracy should be in terms of uncertainty. Good accuracy implies small random and systematic errors.

NOTE 2 The use of the term "precision" for "accuracy" should be avoided.

2.99 Acronyms

			See
2.99.001	API	American Petroleum Institute	2.10.005

2.99.010	CFPP	cold filter plugging point	2.30.150
2.99.333	JFTOT	jet fuel thermal oxidation tester	2.30.022
2.99.401	MON	motor octane number	2.30.101
2.99.566	RON	research octane number	2.30.102
2.99.567	RVP	Reid vapour pressure	2.10.021
2.99.568	ASVP	air-saturated vapour pressure	2.10.022
2.99.580	EP	end point	2.10.042
2.99.581	FBP	final boiling point	2.10.042
2.99.582	IBP	initial boiling point	2.10.041
2.99.583	PF	point final	2.10.042
2.99.584	PI	point initial	2.10.041
2.99.900	VI	viscosity index	2.50.020

ANNEX A

(*informative*)

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[5] EN 12593

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